

5.12 Traffic and Transportation

5.12.1 Introduction

The Applicant proposes to develop a solar energy project called the Ivanpah Solar Electric Generating System (Ivanpah SEGS). It will be located in southern California's Mojave Desert, near the Nevada border, to the west of Ivanpah Dry Lake. The project will be located in San Bernardino County, California, on federal land managed by the Bureau of Land Management (BLM). It will be constructed in three phases: two 100-megawatt (MW) phases (known as Ivanpah 1 and 2) and a 200-MW phase (Ivanpah 3). The phasing is planned so that Ivanpah 1 (the southernmost site) will be constructed first, followed by Ivanpah 2 (the middle site), then Ivanpah 3 (the 200-MW plant on the north), though the order of construction may change. Each 100-MW site requires about 850 acres (or 1.3 square miles); the 200-MW site is about 1,660 acres (or about 2.6 square miles). The total area required for all three phases, including the Administration/Operations and Maintenance building and substation, is approximately 3,400 acres. The Applicant has applied for a right-of-way grant for the land from BLM. Although this is a phased project, it is being analyzed as if all phases are operational.

The heliostat (or mirror) fields focus solar energy on the power tower receivers near the center of each of the heliostat arrays (the 100-MW plants have three arrays and the 200-MW plant has four arrays). In each plant, one Rankine-cycle reheat steam turbine receives live steam from the solar boilers and reheat steam from one solar reheater – located in the power block at the top of its own tower. The solar field and power generation equipment are started each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to keep the turbine online.

Ivanpah 1, 2 and 3 will be interconnected to the Southern California Edison (SCE) grid through upgrades to SCE's 115-kilovolt (kV) line passing through the site on a northeast southwest right-of-way. These upgrades will include the construction by SCE of a new 220/115-kV breaker-and-a-half substation between the Ivanpah 1 and 2 project sites. This new substation and the 220-kV upgrades will be for the benefit of Ivanpah and other Interconnection Customers in the region. The existing 115-kV transmission line from the El Dorado substation will be replaced with a double-circuit 220-kV overhead line that will be looped into the new substation. Power from Ivanpah 1, 2 and 3 will be transmitted at 115 kV to the new substation. SCE plans to add three new 115-kV lines to increase capacity to the existing El Dorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115-kV line heading southwest. The timing of this upgrade depends upon the development of wind projects ahead in the queue, and is not affected by the Ivanpah SEGS project.

Each phase of the project includes a small package natural gas-fired start-up boiler to provide heat for plant start-up and during temporary cloud cover. The project's natural gas system will be connected to the Kern River Gas Transmission Line, which passes less than half a mile to the north of the project site. Raw water will be drawn daily from one of two onsite wells, located east of Ivanpah 2. Each well will have sufficient capacity to supply water for all three phases. Groundwater will go through a treatment system for use as boiler make-up water and to wash the heliostats. To save water in the site's desert environment, each plant will use a dry-cooling condenser. Water consumption is, therefore, minimal

(estimated at no more than 100 acre-feet/year for all three phases). Each phase includes a small onsite wastewater plant located in the power block that treats wastewater from domestic waste streams such as showers and toilets. A larger sewage package treatment plant will also be located at the Administration Building/Operations and Maintenance area, located between Ivanpah 1 and 2. Sewage sludge will be removed from the site by a sanitary service provider. No wastewater will be generated by the system, except for a small stream that will be treated and used for landscape irrigation. If necessary, a small filter/purification system will be used to provide potable water at the Administration Building.

This subsection assesses the traffic and transportation impacts associated with the construction and operation of the Ivanpah SEGS. This analysis primarily examines impacts on roadway levels of service expected during both construction and operation of the project.

This subsection is organized as follows: Section 5.12.2 describes applicable laws, ordinances, regulations, and standards (LORS). Section 5.12.3 describes the local and regional traffic and transportation routes surrounding the Ivanpah SEGS. Section 5.12.4 evaluates the project's impact on local traffic volumes and patterns. Section 5.12.5 evaluates potential cumulative effects. Section 5.12.6 describes mitigation measures for the project. Section 5.12.7 lists the agency contacts used to address traffic and transportation issues. Section 5.12.8 discusses traffic and transportation permits required. Section 5.12.9 lists the references used to prepare this section.

5.12.2 Laws, Ordinances, Regulations, and Standards

Table 5.12-1 lists the federal, state, and local LORS that apply to traffic and transportation. Additional information concerning these LORS is presented below. Because the transportation impacts affect both California and Nevada, local LORS for both San Bernardino County, California and Clark County, Nevada are outlined.

TABLE 5.12-1
Laws, Ordinances, Regulations, and Standards Applicable to Ivanpah SEGS Transportation

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
49 CFR 171-177	Govern the transportation of hazardous materials, including the marking of the transportation vehicles.	U.S. Department of Transportation and Caltrans	Section 5.12.2.1
49 CFR 350-399 and Appendices A-G	Address safety considerations for the transport of goods, materials, and substances over public highways.	U.S. Department of Transportation and Caltrans	Sections 5.12.2.1 and 5.12.4.3.2
49 CFR 397.9	Establishes criteria and regulations for the safe transportation of hazardous materials.	U.S. Department of Transportation and Caltrans	Section 5.12.2.1

TABLE 5.12-1

Laws, Ordinances, Regulations, and Standards Applicable to Ivanpah SEGS Transportation

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
14 CFR 77.13(2)(i)	Requires applicants to notify Federal Aviation Administration (FAA) of construction, within 20,000 feet of an airport, of greater height than an imaginary surface as defined by the FAA.	U.S. Department of Transportation and Federal Aviation Administration	Section 5.12.2.1
14 CFR 77.17	Requires applicant for construction within 20,000 feet of an airport to submit Form 7460-1 to the FAA.	U.S. Department of Transportation and Federal Aviation Administration	Section 5.12.2.1
14 CFR 77.21, 77.23, and 77.25	Outline the obstruction standards that the FAA uses to determine whether an air navigation conflict exists for structures within 3 nautical miles of an airport.	U.S. Department of Transportation and Federal Aviation Administration	Section 5.12.2.1
State			
California Vehicle Code, Sections 13369, 15275, and 15278	Address the licensing of drivers and classifications of licenses required to operate particular types of vehicles, including certificates permitting the operation of vehicles transporting hazardous materials.	Caltrans	Section 5.12.2.2
California Vehicle Code, Sections 25160 et seq.	Address the safe transport of hazardous materials.	Caltrans	Section 5.12.2.2
California Vehicle Code, Sections 2500-2505	Authorize the issuance of licenses by the Commissioner of the California Highway Patrol (CHP) to transport hazardous materials, including explosives.	Caltrans	Section 5.12.2.2
California Vehicle Code, Section 31303	Requires transporters of hazardous materials to use the shortest route possible.	Caltrans	Sections 5.12.2.2 and 5.12.4.3.2
California Vehicle Code, Sections 31600-31620	Regulate the transportation of explosive materials.	Caltrans	Section 5.12.2.2
California Vehicle Code, Sections 32100-32109	Requires transporters of inhalation hazardous materials or explosive materials to obtain a Hazardous Materials Transportation License.	Caltrans	Sections 5.12.2.2 and 5.12.4.3.2
California Vehicle Code, Sections 34000-34121	Establish special requirements for transporting flammable and combustible liquids over public roads and highways.	Caltrans	Section 5.12.2.2

TABLE 5.12-1

Laws, Ordinances, Regulations, and Standards Applicable to Ivanpah SEGS Transportation

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
California Vehicle Code, Sections 34500, 34501, 34505, 34506, 34507, and 34510	Regulate the safe operation of vehicles, including those used to transport hazardous materials.	Caltrans	Section 5.12.2.2
California Vehicle Code, Section 35100 et seq.	Specifies limits for vehicle width.	Caltrans	Section 5.12.2.2
California Vehicle Code, Section 35250 et seq.	Specifies limits for vehicle height.	Caltrans	Section 5.12.2.2
California Vehicle Code, Section 35400 et seq.	Specifies limits for vehicle length.	Caltrans	Section 5.12.2.2
California Vehicle Code, Section 35780	Requires a Single-Trip Transportation Permit to transport oversized or excessive loads over state highways.	Caltrans	Section 5.12.2.2
Nevada Administrative Code Section 459.9785	Lists prerequisites to transportation of Hazardous Materials for which federal safety permit is required.	US Department of Transportation/Nevada Department of Transportation (NDOT)	Sections 5.12.2.2 and 5.12.4.3.2
Nevada Administrative Code Sections 459.979, 459.9805, 459.98055, 459.982 and 459.983	Address registration and uniform permit requirements.	NDOT	Section 5.12.2.2
Nevada Administrative Code Section 459.984	Addresses the obtainment, use, expiration, and fee of single trip permits.	NDOT	Section 5.12.2.2
Nevada Administrative Code Section 459.986	Addresses inspection of vehicles and verification of drivers' qualifications.	NDOT	Section 5.12.2.2
Nevada Department of Transportation Commercial Vehicle Handbook	Addresses issues specific to commercial vehicles trucking in Nevada.	NDOT	Section 5.12.2.2
Local			
The County of San Bernardino General Plan	The plan sets forth eight goals that address circulation issues in the County. In addition, four goals address specifically issues in the Desert region.	San Bernardino County	Sections 5.12.2.3 and 5.12.4.2

TABLE 5.12-1

Laws, Ordinances, Regulations, and Standards Applicable to Ivanpah SEGS Transportation

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
San Bernardino County Code Title 5 division 1 Highway Permit	Addresses permitting issues for oversize/overweight vehicles.	San Bernardino County	Section 5.12.2.3
Clark County Code sections 15.30.060 and 15.30.070	Address the certificate requirements upon transportation of hazardous materials and applicable service charges.	Clark County	Sections 5.12.2.3 and 5.12.4.3.2
Clark County Code sections 15.30.080	Addresses the timeframe for removal of a shipment of hazardous materials from carrier's property.	Clark County	Section 5.12.2.3
Clark County Code section 15.30.090	Addresses the eligible routes for hazardous material transportation.	Clark County	Sections 5.12.2.3 and 5.12.4.3.2
Clark County Code sections 14.46.070 and 14.46.030	Addresses the permitting of overwide or commercial vehicles and designates truck routes.	Clark County	Section 5.12.2.3

5.12.2.1 Federal LORS

- Title 49, Code of Federal Regulations (CFR), Sections 171-177, govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles. The project will conform to this law by requiring that shippers of hazardous materials use the required markings on their transportation vehicles.
- Title 49 CFR, Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways. The project will comply with all standards for the transportation of goods, materials, and substances over public highways.
- Title 49 CFR, Section 397.9, the Hazardous Materials Transportation Act of 1974, directs the United States Department of Transportation to establish criteria and regulations for the safe transportation of hazardous materials. The project will comply with all standards for the transportation of hazardous materials.
- Title 14, CFR, Section 77.13(2)(i), requires an applicant to notify the FAA of the construction of structures within 20,000 feet of the nearest point of the nearest runway of an airport with at least one runway longer than 3,200 feet. No airport meets these criteria in the project's vicinity; therefore, no further action is required by the Applicant.
- Title 14, CFR, Section 77.17, requires an applicant to submit a Notice of Proposed Construction or Alteration (FAA Form No. 7460-1) to the FAA for construction within 20,000 feet of the nearest runway of an airport with at least one runway longer than 3,200 feet. No airport meets these criteria in the project's vicinity; therefore, no further action is required by the Applicant.

- Title 14, CFR, Sections 77.21, 77.23, and 77.25, outline the criteria used by the FAA to determine whether an obstruction will create an air navigation conflict. The project will comply with this requirement by filing FAA Form 7460-1 to allow FAA to determine if any of the structures will create an air navigation conflict.

5.12.2.2 State LORS

- California Vehicle Code, Sections 13369, 15275, and 15278, address the licensing of drivers and classifications of licenses required to operate particular types of vehicles. In addition, certificates permitting the operation of vehicles transporting hazardous materials are addressed. The project will conform to this law by requiring shippers to obtain required licenses and certificates.
- California Vehicle Code, Sections 25160 et seq., address the safe transport of hazardous materials. The project will comply with safety requirements.
- California Vehicle Code, Sections 2500-2505, authorize the issuance of licenses by the Commissioner of the CHP to transport hazardous materials, including explosives. The project will comply with licensing requirements.
- California Vehicle Code, Section 31303, requires that hazardous materials be transported on the state or interstate highway that offers the shortest overall transit time possible. The project will conform to this law by requiring shippers of hazardous materials to use the shortest route feasible to and from the project site.
- California Vehicle Code, Sections 31600-31620 regulate the transportation of explosive materials. The project will comply with these regulations.
- California Vehicle Code, Sections 32100-32109, establish special requirements for the transportation of substances presenting inhalation hazards and poisonous gases. California Vehicle Code, Section 32105 requires that shippers of inhalation hazardous or explosive materials contact the CHP and apply for a Hazardous Material Transportation License. The project will conform to this law by requiring shippers of these types of material to obtain the Hazardous Material Transportation License.
- California Vehicle Code, Sections 34000-34121, establish special requirements for transporting flammable and combustible liquids over public roads and highways. The project will comply with these requirements.
- California Vehicle Code, Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5, and 34510-11, regulate the safe operation of vehicles, including those used to transport hazardous materials. The project will comply with these regulations.
- California Vehicle Code, Sections 35100-35559, specify limits for vehicle width, height, length, and gross weight. Specifically, Section 35550 states: "The gross weight imposed upon the highway by the wheels on any one axle of a vehicle shall not exceed 20,000 pounds and the gross weight upon any one wheel, or wheels, supporting one end of an axle, and resting upon the roadway, shall not exceed 10,500 pounds." The project will comply with these requirements by limiting vehicle sizes and gross weights to the

specified limits or by obtaining a Single-Trip Transportation Permit for oversized or excessive loads over state highways, as described in the next paragraph.

- California Vehicle Code, Section 35780, requires a Single-Trip Transportation Permit to transport oversized or excessive loads over state highways. The permit can be acquired through the California Department of Transportation (Caltrans). This law is enforced by the CHP. The project will conform to this law by requiring that shippers obtain a Single-Trip Transportation Permit for oversized loads for each vehicle.
- Nevada Administrative Code Section 459.9785 addresses the seven prerequisites to transportation of hazardous materials for which federal safety permit required. The project will comply with these requirements.
- Nevada Administrative Code Sections 459.979, 459.9805, 459.98055, 459.982 and 459.983 address registration and uniform permit requirements. Except as otherwise provided in Nevada Administrative Code 459.980 and 459.984, any person who transports hazardous materials in a vehicle upon a public highway in the State shall register with and obtain a uniform permit. The project will comply with these requirements.
- Nevada Administrative Code Section 459.984 addresses the obtainment, use, expiration, and fee of single trip permits. The single-trip permit can be obtained in lieu of the uniform permit from any authorized vendor before or at the time of entry into Nevada. Single trip permits cannot be used to transport hazardous material set forth in 49 C.F.R. paragraph 385.403. The project will comply with these requirements.
- Nevada Administrative Code Section 459.986 presents the rules regarding the inspection of vehicles and verification of drivers' qualifications. The project will comply with these requirements.
- NDOT requires truckers who have not declared Nevada under the International Registration Plan, who rarely make trips to Nevada, who do not register their vehicles because of infrequent use, or who need to temporarily increase the declared gross weight from the registered weight to obtain a temporary trip permit for a fee. The project will comply with these requirements.
- NDOT specifies the height, width, length, and weight limitations. If a shipment exceeds these, an Overdimensional Permit is required for a fee. The project will comply with these requirements.

5.12.2.3 Local LORS

- San Bernardino County's General Plan Circulation Element discusses and analyzes the movement of people and goods throughout and around the county. The General Plan sets forth eight goals that address regional traffic on freeways and major arterials promoting public transit and alternate modes of transportation. In addition, four goals have been set forth specifically for the Desert region. One of the policies is that "all new development proposals do not degrade levels of service on Major Arterials below [level of service (LOS)] C in the Desert Region." Also, "signalized intersection mitigation may be required if a reduction of two or more levels of service is experienced when adding the development traffic to the intersection or as traffic increases. The signalized

intersection level of service...should not be reduced below LOS C by the operations method, considering only the major traffic movement.” Regarding the unsignalized intersections, “mitigation may be required if the unsignalized intersection level of service...decreases one level of service to LOS B on the major, nonstopped street. Mitigation may also be required if the level of service on the minor, stopped street decreases two levels of service or drops below LOS C...” If needed, Ivanpah SEGS will propose mitigation measures and/or implement a traffic management plan during construction to reduce impacts to conform to these constraints.

- The County of San Bernardino requires a permit before operating any oversize and/or overweight vehicles within the County. The project will comply with requirements by obtaining the permit from the County before operating any oversize and/or overweight vehicles within the County.
- Clark County Code requires a certificate from the fire chief allowing transportation of hazardous materials upon the highways, streets and roads or railways within the unincorporated towns and other unincorporated areas of Clark County. Upon final approval, a service charge will be collected. The project will comply with these requirements.
- Clark County Code requires the consignee of each shipment of hazardous materials to remove the shipment from the carrier’s property within 48 hours after notice of arrival has been sent or given. If not so removed, the carrier shall immediately notify the fire chief. The project will comply with these requirements.
- Clark County Code has additional regulations regarding the routes chosen for hazardous materials transportation. Those portions of public highways and streets within the unincorporated towns of Paradise, Winchester, Spring Valley, Sunrise Manor, and East Las Vegas are not eligible unless there is a point of origin, destination or handling within those unincorporated towns. However, the use of major thoroughfares is acceptable. The project will comply with these requirements.
- Clark County Code qualifies as unlawful the operation or movement of any overwide commercial vehicle or special mobile equipment over any public road, highway or alley within the unincorporated area of Clark County that is maintained by Clark County, except upon designated truck routes, within the unincorporated areas of Clark County without first obtaining a special permit. A list of designated truck routes is also provided for use by commercial vehicles. The project will comply with these requirements.

5.12.3 Affected Environment

Ivanpah SEGS will be located in southern California’s Mojave Desert in San Bernardino County near the California–Nevada border. The project site is located in a rural area and is currently undeveloped and unoccupied. This area is served by Interstate 15 (I-15) and local streets. The closest public business is the Primm Valley Golf Club, which operates the Lakes course (opened in February 1997) and the Desert Course (opened in May 1998). An industrial facility is located on the other side of I-15.

5.12.3.1 Surrounding Roadway Network

The surrounding regional and local roadway networks are shown in Figures 5.12-1 and 5.12-2, respectively.

Regional access to the site is provided from the south via I-15 and Highway 164 (Joshua Tree Highway, becoming Nipton Road at the California–Nevada border), which traverse through the region in a north-south and the east-west direction, respectively. To the north (south of Las Vegas), I-215 and Highway 604 are the closest major facilities that feed into I-15. Local roadways in the Ivanpah SEGS vicinity include Yates Well Road and a dirt road named Colosseum Road.

Between the Nevada state line and the junction to I-5 (in San Diego), Caltrans designates I-15 as part of the statewide truck network, and there is no weight limitation on this segment. According to County staff, local roadways in the project vicinity do not have weight limitations.

5.12.3.2 Existing Traffic Conditions

The Ivanpah SEGS employees and construction workers commuting during the construction of the project may affect the roadways described below:

- I-15, which passes east of the construction site, is a divided freeway with two lanes in each direction.
- Yates Well Road is located immediately to the south of the project site and will be used by all the Ivanpah SEGS construction and operations traffic to access the facility. Yates Well Road is a two-lane east-west arterial providing direct access to I-15. The ramp terminal intersections at the I-15/Yates Well Road interchange are stop-controlled, and there are no other controlled intersections on Yates Well Road in the vicinity of the Ivanpah SEGS.
- Colosseum Road is an east-west two-lane dirt road providing access to the site and the Primm Valley golf course. Colosseum Road is located immediately to the east of the project site, and connects to Yates Well Road.

To assess the potential impacts of the Ivanpah SEGS employees and construction workers, the following three intersections were evaluated:

- Colosseum Road and Yates Well Road (Intersection 1)
- I-15 southbound ramps at Yates Well Road (Intersection 2)
- I-15 northbound ramps at Yates Well Road (Intersection 3)

Existing daily average and peak volumes on selected roadway segments in the vicinity of the project site were obtained from Caltrans and San Bernardino County traffic volume counts. Existing morning and afternoon peak-hour turning movement counts are illustrated in Figures 5.12-3 and 5.12-4. Recent traffic counts were not available for all movements, so the following assumptions were made:

- At Intersection 1, all traffic goes to or comes from the golf course. There is no traffic on Colosseum Road east of Yates Well road during peak periods.

- At Intersection 2, bi-directional counts provided by San Bernardino County were split equally between eastbound and westbound traffic on Yates Well Road west of I-15 southbound ramps. Eighty percent go to the golf course and 20 percent come out of the golf course during four hours each morning. The PM peak for golf course traffic was also assumed to be four hours. It has also been assumed that 75 percent of the traffic originated from Nevada, while 25 percent originated from California; these percentages have been observed on Caltrans' ramp volumes reports.
- At Intersection 3, bi-directional counts provided by San Bernardino County were considered on Yates Well Road east of I-15 northbound ramps. All traffic to and from the staging area for road construction is assumed to originate from California.
- 20 percent of traffic going into or out of the staging area for road construction is assumed to be heavy vehicles. The definition of heavy vehicle is a vehicle having more than four wheels touching the ground (HCM, 2000).
- 5 percent of traffic going into or out of the golf course consists of heavy vehicles.

Traffic conditions were evaluated using the HCS+ software (McTrans, version 5.21). HCS+ is a traffic operations analysis tool that incorporates analytical tools from the industry-standard 2000 Highway Capacity Manual (HCM). LOS is identified through a letter designation, varying from LOS A to LOS F, as described in Table 5.12-2.

TABLE 5.12-2
Level of Service Criteria for Unsignalized Intersection

LOS	Control Delay (seconds/vehicle)
A	≤ 10
B	> 10 and < 15
C	> 15 and < 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

Source: Transportation Research Board, 2000, Highway Capacity Manual.

The San Bernardino County General Plan Desert Region Goals and Policies of the Circulation and Infrastructure Element states that “unsignalized intersection mitigation may be required if the unsignalized intersection level of service...decreases one level of service to LOS B on the major, nonstopped street. Mitigation may also be required if the level of service on the minor, stopped street decreases two levels of service or drops below LOS C...” in the Desert region. Therefore, LOS A on major and LOS B on minor approaches are considered to be the limits of acceptable levels of service for intersections in this study. Existing levels of service at the intersections in the vicinity of the Ivanpah SEGS are presented in Table 5.12-3. All of the LOS values during the morning and afternoon peak hours are acceptable.

TABLE 5.12-3
Existing Conditions Levels of Service

Intersection	AM LOS	PM LOS
Colosseum Rd at Yates Well Road Westbound left/through approach	A	A
Colosseum Rd at Yates Well Road Northbound left/right approach	A	A
I-15 southbound ramps at Yates Well Road Westbound left/through approach	A	A
I-15 southbound ramps at Yates Well Road Southbound left/through/right approach	A	A
I-15 northbound ramps at Yates Well Road Eastbound left/through approach	A	A
I-15 northbound ramps at Yates Well Road Northbound left/through/right approach	A	A

Recurring congestion occurs on Friday evenings on northbound I-15 between San Bernardino and Las Vegas. Figure 5.12-5 is a graph of the traffic volumes on I-15 for three Fridays in June and July (2006). The daily traffic pattern has a peak in volumes around 1 p.m. before volumes decrease in the rest of the afternoon. The reason is that the congestion results in lower speeds on the freeway, as the facility operates at LOS F.

5.12.3.3 Public Transit

There is no public transit service in the vicinity of the project site. Amtrak serves the corridor via bus only, with service between Las Vegas and Los Angeles.

Many private bus companies operate on demand for Primm Valley Golf Club customers, but there is no established regular schedule.

5.12.3.4 Bicycle Lanes/Paths

There are no bicycle facilities in the project area.

5.12.3.5 Railway Routes

There is a railway line that goes from California into Primm (past the Big Horn power plant). However, construction traffic is not expected to cross the railroad.

5.12.3.6 Airports

McCarran International Airport in Las Vegas is about 44 miles north of the project site. The Jean Airport is about 20 miles north of the project site in Jean, Nevada. The closest airport in San Bernardino County is Barstow-Daggett Airport, 101 miles south of the project location. The closest airport in Arizona is Bullhead Laughlin Airport, 56 miles east of the project site. A new commercial airport, the Ivanpah Valley Airport, has been proposed between Jean and Primm, Nevada. The southern end of the airport boundary will be about 6 miles north of the project site.

5.12.3.7 Other Projects

Planned transportation construction projects in the Ivanpah SEGS vicinity include:

- The construction on the Desert Xpress Rail Line.
- The improvement of I-15, including the construction of a point-of-entry inspection station near the border, the addition of a 12-mile long northbound truck descending lane and pavement rehabilitation, and the regrading of median slopes.
- The construction of Southern Nevada Supplemental Airport (Ivanpah Valley Airport).

Other reasonably foreseeable future actions in the vicinity of ISEGS include:

- The construction of Las Vegas Valley Water District pipeline.
- The construction of a solar trough project
- The construction of Table Mountain Wind Energy Generating facility.

Details on each of these projects can be found in Section 5.6.7 of Land Use.

5.12.3.8 Public Safety

Caltrans and NDOT both actively monitor traffic operations and accident histories on I-15.

5.12.4 Environmental Analysis

The impact of the project is measured by the potential change in the traffic operations of surrounding intersections and I-15. Traffic generated by the project is added to the existing volumes, and the resulting impacts are assessed. This assessment was conducted only for the construction phase of the Ivanpah SEGS because the operational workforce for all three phases is projected to be 90 people – at least 60 of which will work a night shift. The operational workforce is substantially less than the construction workforce, and thus, the assessment was conducted only for the construction workforce.

5.12.4.1 Significance Criteria

Impacts of the proposed project to transportation and circulation will be considered significant if the following criteria are met:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- Exceed, either individually or cumulatively, a LOS standard established by the county.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature or incompatible uses.
- Result in inadequate emergency access.
- Result in inadequate parking capacity.
- Conflict with adopted policies, plans, or programs supporting alternative transportation.

5.12.4.2 Summary of Construction-Phase Impacts

During the peak construction period, the project is expected to generate approximately 243 daily construction worker round-trips. To analyze the worst-case scenario, traffic impacts associated with peak period construction traffic were considered.

5.12.4.2.1 Trip Generation

Table 5.12-4 summarizes the anticipated construction workers by month. The construction effort (during construction of Ivanpah 2 and Ivanpah 3) is anticipated to require a maximum of 959 workers per day. Thus, the peak construction period is Month 32. (See Section 5.10, Socioeconomics, for a detailed breakdown of the construction workforce by phase).

TABLE 5.12-4
Construction Worker Summary

Construction Month	Number of Staff Needed	Number of Buses required	Number of Personal Cars Required
1	13	1	3
2	13	1	3
3	77	3	15
4	77	3	15
5	83	3	17
6	83	3	17
7	167	7	33
8	324	13	65
9	327	13	65
10	370	15	74
11	338	14	68
12	348	14	70
13	370	15	74
14	395	16	79
15	550	22	110
16	634	25	127
17	581	23	116
18	581	23	116
19	656	26	131
20	800	32	160
21	659	26	132
22	588	24	118
23	389	16	78
24	381	15	76

TABLE 5.12-4
Construction Worker Summary

Construction Month	Number of Staff Needed	Number of Buses required	Number of Personal Cars Required
25	370	15	74
26	395	16	79
27	575	23	115
28	659	26	132
29	608	24	122
30	608	24	122
31	701	28	140
32	959	39	192
33	825	33	165
34	767	31	153
35	557	22	111
36	559	22	112
37	554	22	111
38	587	23	117
39	689	28	138
40	798	32	160
41	722	29	144
42	722	29	144
43	740	30	148
44	721	29	144
45	425	17	85
46	277	11	55
47	68	3	14
48	44	2	9

The main assumptions are:

- 60 percent of staff would arrive by bus transport (15-passenger bus). The HCM methodologies consider the impact of buses the same as passenger vehicles.
- 40 percent of staff would arrive by private vehicle; the typical vehicle occupancy rate would be 2 persons per vehicle.

The maximum number of staff needed is reached during month 32 (959 workers). Applying the assumptions above, it is forecasted that 39 buses and 192 private vehicles will be needed to transport workers to the project site.

The construction materials deliveries are as follows:

- There will be an average of 113 trucks per month during heliostat construction, i.e., 28 trucks per week, shipped in 4 weekly batches.
- The power block construction will require 30 trucks at most per day (12 delivery trucks and 18 heavy vehicles).
- The grading equipment consists of 1 truck per construction equipment operator, and it takes 2 days to arrive to the site.

Staff vehicles will arrive and depart during the period of 5:00 a.m. to 7:00 p.m. Because the worst case scenario is considered, it is assumed that the construction traffic arrives and departs during the morning and afternoon peak periods of the surrounding roadway network. However, it is more reasonable to assume that construction materials deliveries arrive at the site throughout the day (over a 12-hour period).

Therefore, the peak construction traffic in month 32 consists of 7 container trucks for heliostat fields, 2 delivery trucks for the power block, 3 heavy vehicles for the power block, 39 transport buses for the workers, and 192 workers' private vehicles, totaling 243 construction vehicles (5 percent are considered heavy vehicles).

5.12.4.2.2 Trip Distribution

Trip distribution for construction project traffic is illustrated in Figure 5.12-6. All buses transporting staff would come from Las Vegas. Approximately 95 percent of workers' private vehicles are assumed to originate in Las Vegas ($192 \times 95\% = 183$ vehicles). The remaining 5 percent of the private vehicles is assumed to come from California ($192 - 183 = 9$ vehicles). It is assumed that the heliostat field items are shipped from Long Beach, California and power block items are shipped from Nevada.

In total, 227 vehicles would come from Nevada (39 buses + 183 private vehicles + 5 power block item deliveries) into the site, and 16 vehicles would come from California (9 private vehicles + 7 heliostat item deliveries).

5.12.4.3 Existing Plus Project Traffic Impacts

Roadways in the vicinity of the project will be affected by the project's construction-related traffic. Construction plus existing traffic volumes for the morning and afternoon peak-hour turning movement counts are illustrated in Figures 5.12-7 and 5.12-8.

An HCM intersection analysis was conducted for the six approaches that will be most directly affected by project construction traffic. Construction period intersection volumes were generated by adding the project peak intersection volumes to the existing peak intersection volumes. Table 5.12-5 presents the change in LOS with the addition of project peak construction traffic during the morning and afternoon peak hours. The findings are that the construction of the Ivanpah SEGS will not result in significant changes in LOS.

TABLE 5.12-5
Construction Conditions Levels of Service

Intersection	AM LOS	PM LOS
Colosseum Rd at Yates Well Rd Westbound Left/Through approach	A	A
Colosseum Rd at Yates Well Rd Northbound Left/Right approach	A	A
I-15 Southbound Ramps at Yates Well Rd Westbound Left/Through approach	A	A
I-15 Southbound Ramps at Yates Well Rd Southbound Left/Through/Right approach	A	A
I-15 Northbound Ramps at Yates Well Rd Eastbound Left/Through approach	A	A
I-15 Northbound Ramps at Yates Well Rd Northbound Left/Through/Right approach	A	B*

* Indicates change in LOS.

All approaches operate at an acceptable level of service during the AM peak period. During the PM peak period, only one approach (I-15 northbound ramps at Yates Well Road northbound left/through/right approach) has degraded to LOS B. However, because it is a minor approach (stop-controlled), no mitigation will be required as per San Bernardino County's General Plan.

I-15 operates at LOS F on Fridays. The project cannot cause further degradation of the level of service category (i.e., there is no level of service category below F). However, the project will result in the addition of 227 vehicles to northbound I-15 to an already highly congested route. Although the number of vehicles added to northbound I-15 on Friday as a result of the project would be minor as compared to the number of vehicles traveling on northbound I-15 on Friday, the project has the potential to exacerbate congestion on I-15 in the area of Yates Well Road. Because the roadway is already highly congested and because the project may exacerbate this congestion in the area of Yates Well Road, impacts to traffic on northbound I-15 on Friday are considered significant.

5.12.4.3.1 Natural Gas, Water, Wastewater, and Sanitary Sewer Pipeline Construction Impacts

Potable water will come from wells located about 0.5 mile to the east of Ivanpah 2. It will be treated using a package treatment plant. Fire suppression water will be stored onsite in the raw water tank reserved for that purpose. The project includes a small package sewage system located at each power block and at the Administration Building/Operations and Maintenance building for potable water streams, including showers and toilet. Sewage sludge is removed from the site by sanitary service. All wastewater is recycled in the system except for a small stream of treated water that will be used for landscape irrigation. Recycled water is not available. Therefore, there will not be any traffic impacts due to water line construction.

Approximately 5.3 miles of new 4- to 6-inch-diameter natural gas pipeline from the Kern River Gas Transmission Line will extend south through the Ivanpah 3 and Ivanpah 2 sites to

the power block of the Ivanpah 1 site. The gas line will connect to the Kern River line about 0.5 mile north of the Ivanpah 3 boundary. The line will not require public road closure, and thus will not affect traffic.

5.12.4.3.2 Transmission Line Construction Impacts

Ivanpah 1, 2, and 3 will be interconnected to the grid through upgrades to SCE's 115-kV line passing through the site on a northeast-southwest right-of-way. Ivanpah 1 is connected to the substation with a 5,800-foot-long line; Ivanpah 2 is connected through the substation with a 3,900-foot-long line; Ivanpah 3 is connected through the substation with a 14,100-foot-long line. Construction of the lines will not require public road closure and will not affect traffic.

5.12.4.3.3 Realignment of Colosseum Road

Colosseum Road currently runs through the Ivanpah 2 site as a dirt road. To meet the needs of the project, the seldom-used road will be realigned to run between Ivanpah 1 and Ivanpah 2, as shown in Figure 1.2-3. The road work, which may involve complete lane closure and re-routing of traffic on temporary dirt roads, is unlikely to disturb the infrequent traffic on this part of Colosseum Road.

5.12.4.3.4 Construction Laydown and Parking

Areas to be used for construction laydown and parking are within the heliostat field area of each site. No extra trips will be generated to reach the construction site from the parking lots.

5.12.4.4 Summary of Operation Phase Impacts

The operational phase of the proposed project will require 90 employee commutes, or 180 daily trips. A quantitative traffic analysis was not conducted for the long-term operations phase because it will generate a low volume of peak-hour trips (only 30 employees are required for the daytime shift; the remaining 60 employees are on the night time shift, and will very likely travel off peak period). This will not have a significant impact on traffic operations in the study area.

5.12.4.4.1 Project Operations and Maintenance

During operations of the Ivanpah SEGS, it is estimated that 90 employees will work on site¹. However, the maximum number of personnel on the project site commuting during peak hours would not exceed 30.

The addition of traffic associated with project operations during the peak hours will not be significant. For the intersections, traffic volumes are much lower than during the construction phase, which was found to have no significant impacts on the intersections. For the freeway, the operations phase will add no more than one percent to the total traffic on I-15, if all of these workers commute in private vehicles on Friday evenings.

5.12.4.4.2 Transport of Hazardous Materials

Transport of hazardous materials and waste water from/to the project site is anticipated on a regular basis. Table 5.12-6 summarizes expected truck trips during operations, including delivery of hazardous materials and removal of wastes per phase. Transport of hazardous

¹ See Section 5.10.4.4.1 for a breakdown of operations staff.

materials during construction is anticipated to be minor (less than once a month). There will be a maximum of 6 truck trips per day.

TABLE 5.12-6

Estimated Truck Traffic Hauling Hazardous Materials at the Facility During Operations, per phase

Delivery Type	Occurrence of Trucks
De-ionization Columns Regeneration	Once per week
Demineralizer Regeneration	Once per month

California Vehicle Codes sections 31303 and 32105 require that hazardous materials be transported along the shortest route possible and that transporters obtain a Hazardous Materials Transportation License from the CHP. Also, Nevada Administrative Code 459.9785 requires the transporter to hold a uniform permit and a safety permit issued by the Federal Motor Carrier Safety Administration of the United States Department of Transportation and to certify that it has a satisfactory security program as required by 49 C.F.R. 385.407(b), including a written route plan that meets the requirements of 49 C.F.R. 397.101 (radioactive materials). If the use of routes within Clark County is needed, Clark County Code specifies the permitting requirements.

Deliveries of hazardous materials will occur over prearranged routes in compliance with applicable LORS. Traffic impacts related to the transport of hazardous materials to the Ivanpah SEGS site will not be significant.

5.12.4.4.3 Public Safety

Construction-related traffic is not expected to cause safety impacts because it will not be routed through residential areas. The anticipated peak daily increase in vehicle trips during construction is 243 round trips. During operation, the number of daily commuter trips will be 56 round trips. This increase in traffic will not significantly increase the congestion-related safety effects.

The only other anticipated increase in traffic during project operation will be up to six truck trips per day for the project, including delivery of hazardous materials and removal of wastes.

5.12.5 Cumulative Effects

Section 5.12.3.7 identifies the following projects that are reasonably foreseeable: Desert Xpress Rail Line; Improvements to I-15; Las Vegas Valley Water District Pipeline; Southern Nevada Supplemental Airport (Ivanpah Valley Airport); and the Table Mountain Wind Generating Facility. Cumulative traffic impacts could occur if construction of these projects overlapped causing a combined impact to Friday afternoon traffic on I-15.

No construction schedule has been provided for the Desert Xpress Rail Line project. The improvements planned along I-15 should be completed before construction activities at the Ivanpah SEGS begin, so it would not contribute to a cumulative impact. It is difficult to determine if the Las Vegas Valley Water District Pipeline would have direct traffic impact because no construction schedule is provided and the construction locations are not

available. The Ivanpah Valley Airport is planning to commence construction in 2010. Construction traffic from the Ivanpah Valley Airport could combine on Friday afternoons with Ivanpah SEGS workforce to create potential cumulative impacts on that section of I-15 between the airport site and Las Vegas. No construction schedule is provided for Table Mountain Wind Generating Facility. However, since construction traffic would also access that project site from I-15 it too could combine to create cumulative impacts to Friday afternoon traffic, should construction occur concurrently with the Ivanpah SEGS project.

However, on its own, the Ivanpah SEGS project would either result in less than significant impacts to traffic or include measures to reduce traffic impacts to less than significant. Because the other projects would all require detailed NEPA analysis and adequate mitigation measures, it is reasonable to assume that they would also include mitigation measures to reduce traffic impacts to a less than significant level. As discussed in the following subsection on mitigation measures, Ivanpah SEGS will prepare a Traffic Management Plan (TMP) to address traffic impacts and identify strategies to minimize those impacts. As part of the TMP, the project will be required to coordinate traffic flows with other major projects along I-15. Hence, cumulative traffic impact would be reduced to the extent possible as part of the TMP.

5.12.6 Mitigation Measures

5.12.6.1 Construction Impacts

Construction of the proposed project will add traffic to local roadways during the construction period. However, the increase in delay at intersections is minimal. At these locations, no significant impact is expected to occur during construction; thus, no mitigation measures have been developed.

For I-15, there will be a significant impact on Friday evenings, as construction traffic returns to Las Vegas. With existing congestion on I-15, additional trips during construction will result in increased congestion for other drivers on I-15. To minimize this impact, the Applicant should require that the selected Construction Contractor implement measures to minimize travel from the site to Las Vegas on Friday afternoons. These measures shall be identified in a TMP, to be developed and implemented prior to construction. The specific TMP elements will be identified once the specifics of the selected Construction Contractor's schedule are known. However, the following TMP elements may be appropriate for reducing construction impacts:

- Stagger shifts, so that workers leave the site over a longer period of time (instead of all at once).
- During construction, shuttle buses will be provided for workers commuting from Las Vegas. These workers will have incentives to use the buses on all days, to reduce their out-of-pocket costs for commuting. The selected Construction Contractor shall provide special or additional incentive to use the buses (or carpool) on Fridays, when congestion will increase travel times. To further encourage ridesharing, the selected Construction Contractor shall work with the construction staff to (1) communicate the benefits of the buses (including travel time savings) and (2) identify any limitations to the buses. For examples, if the bus stops (in Las Vegas) are too far from the workers' residences, additional stops should be added. If workers are driving because they need to carry

their equipment or tools in their private vehicles, the selected Construction Contractor should provide storage lockers on-site.

- The TMP should include provisions for monitoring the traffic impacts on Friday afternoons. Specifically, traffic operations on I-15 from the Yates Well Road interchange to Las Vegas should be monitored. If workers are leaving the site during the hours of congestion on I-15, additional measures should be implemented to minimize the number of trips from the site.

With the implementation of appropriate TMP measures, the impact on I-15 traffic can be reduced to a less-than-significant level.

5.12.6.2 Operations Impacts

The operations-related and maintenance-related traffic associated with the project is minimal and insignificant when added to major movements on freeways and local roadways. Consequently, no operations-related mitigation measures are required.

5.12.7 Involved Agencies and Agency Contacts

Table 5.12-7 lists the agency contacts related to traffic and transportation.

TABLE 5.12-7
Agency Contacts for Ivanpah SEGS Traffic and Transportation

Issue	Agency	Contact
FAA Form 7460-1	Federal Aviation Administration Southwest Regional Office Obstruction Evaluation Service, AJR-32 2601 Meacham Boulevard Fort Worth, TX 76137-0520	(310) 725-6557 (California) karen.mcdonald@faa.gov (718) 553-4546 (Nevada) robert.p.alexander@faa.gov
Single-Trip Transportation Permit for Oversized Loads	Caltrans South Region Transportation Permits Office 655 West 2nd St. San Bernardino, California 92404-1400	(909) 383-4637 Moe.Bhuyian@dot.ca.gov
Hazardous Material Transportation License	California Highway Patrol Accounting Section (HM Licensing Program) P.O. Box 942902 Sacramento, CA 94298-2902	(916) 327-5039 Email form available at: http://www.chp.ca.gov/prog/email.cgi
Transportation Permits	County of San Bernardino 825 East Third Street, Room # 108 San Bernardino, CA 92415-0835	(909) 387-8046 sguzman@dpw.sbcounty.gov
Transportation Permits	Clark County Public Works	(702) 455-6100 jmartin@co.clark.nv.us
Transportation Permits	Nevada Department of Transportation 1263 South Stewart Street Room 102 Carson City, NV 89712	(775) 888-7410 Fax: (702) 888-7103 No email address available.

TABLE 5.12-7
Agency Contacts for Ivanpah SEGS Traffic and Transportation

Issue	Agency	Contact
Safety Permits	Federal Motor Carrier Safety Administration California Field Office 1325 J Street, Suite 1540 Sacramento, CA 95814	(916) 930-2760 Fax: (916) 930-2770 Email contact depends on the nature of the hazardous material hauled.
	Federal Motor Carrier Safety Administration Nevada Field Office 705 North Plaza Street, Suite 204 Carson City, NV 89701	(775) 687 5335 Fax: (775) 687-8353 Email contact depends on the nature of the hazardous material hauled.

5.12.8 Permit Requirements and Permitting Schedule

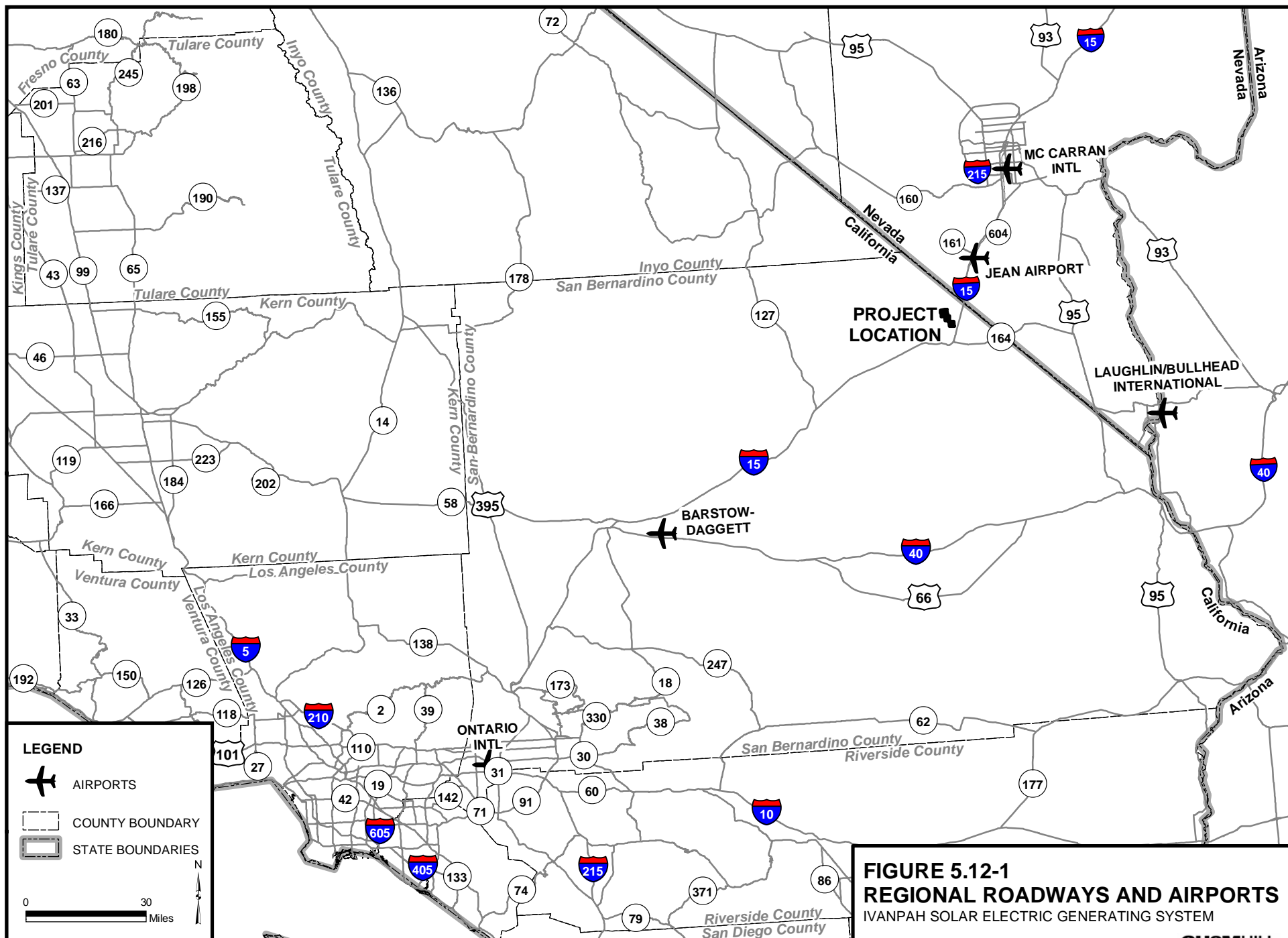
Table 5.12-8 presents the permits required for construction of the project, as well as the schedule for obtaining the permits. The project will comply with these requirements.

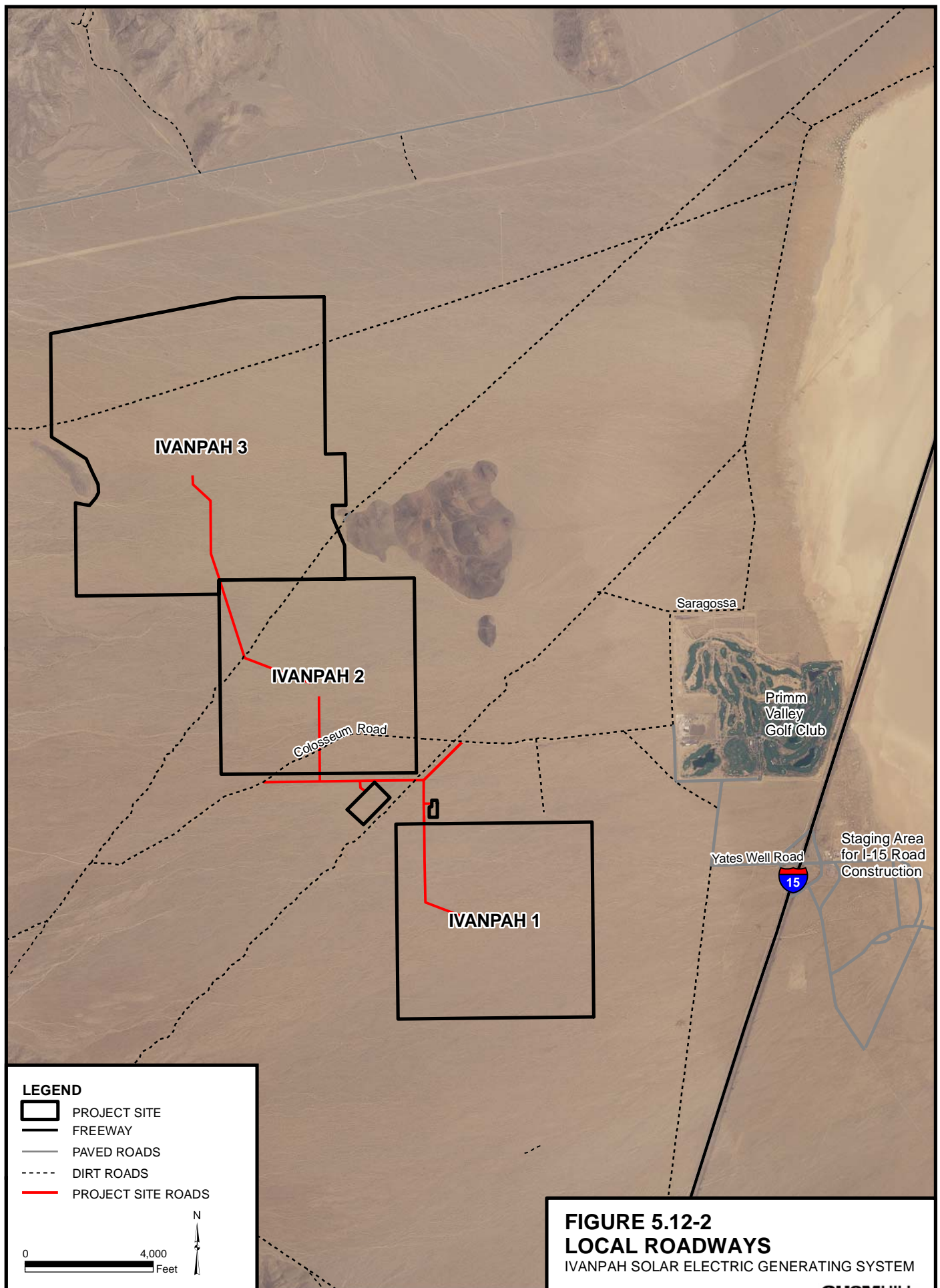
TABLE 5.12-8
Permits and Permit Schedule for Traffic and Transportation

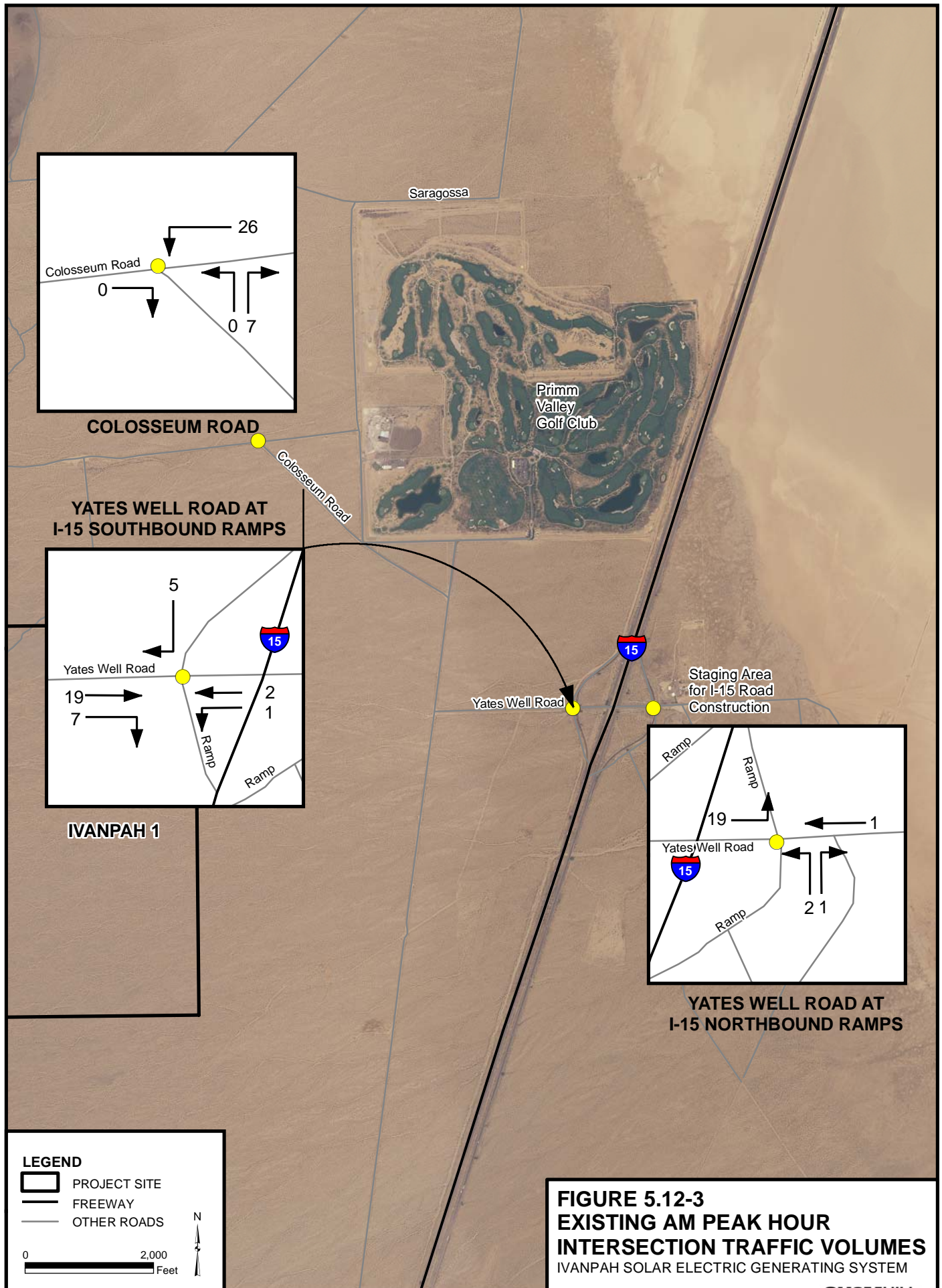
Permit	Agency Contact	Schedule
FAA Form 7460-1	FAA	At least 30 days before the earlier of the following dates: (1) the date of the proposed construction or alteration, or (2) the date an application for a construction permit is to be filed
Caltrans single-trip transportation permit to transport oversized or excessive loads over state highway	Caltrans	4-hour processing time.
Hazardous Material Safety Permit	Federal Motor Carrier Safety Administration	Depends on the nature of the hazardous material hauled.
NDOT oversize permit	NDOT	2 hours processing time for single trip; 2 to 3 weeks for annual permit.
San Bernardino County transportation permit	San Bernardino County Transportation Division	Between 1 hour and 2 weeks.
Clark County Transportation permit	Clark County Transportation Division	Usually a week or less.

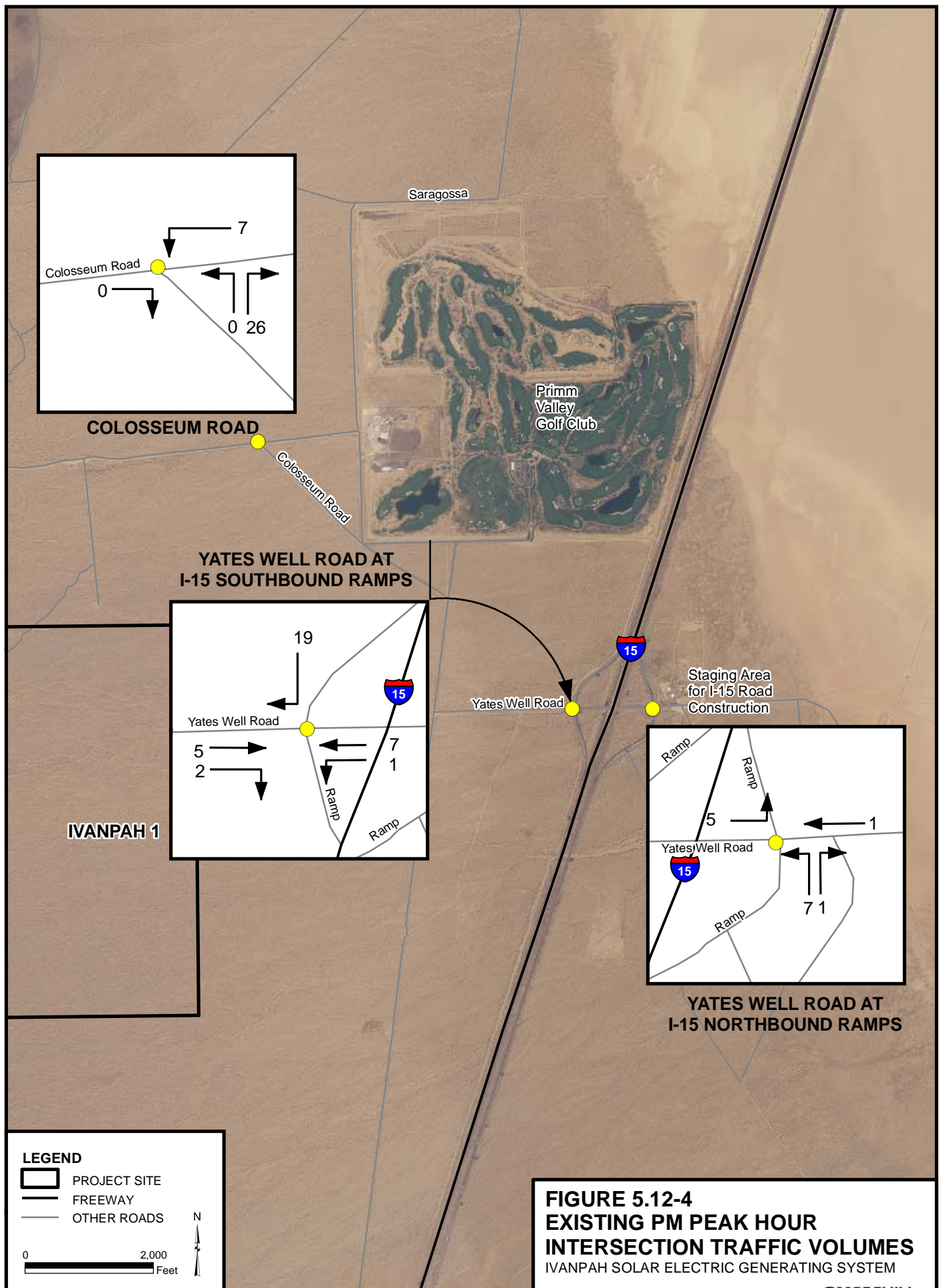
5.12.9 References

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Average Friday Volumes - Northbound I-15

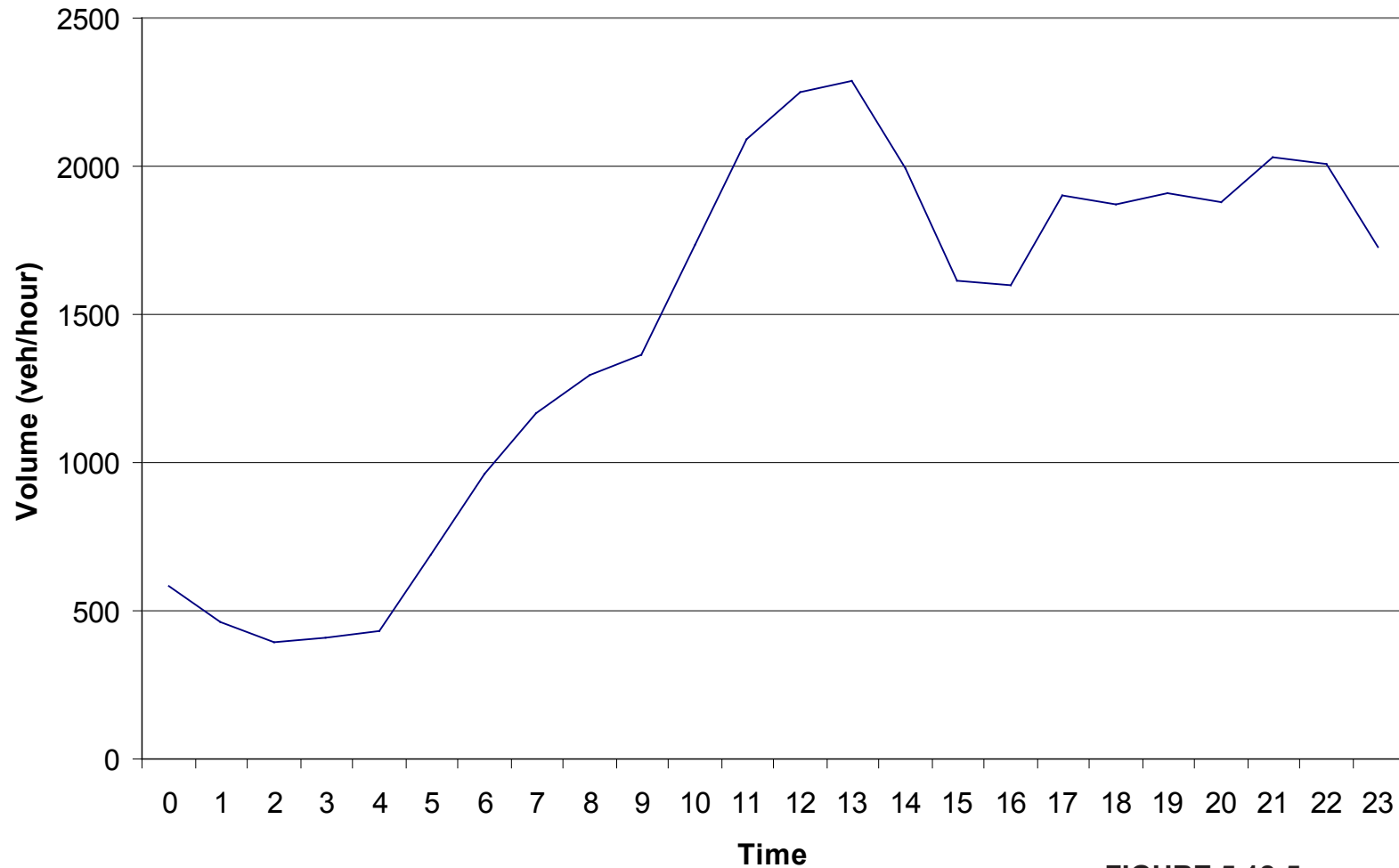


FIGURE 5.12-5
AVERAGE HOURLY TRAFFIC
VOLUMES FOR NORTHBOUND
I-15 ON THREE FRIDAYS IN JUNE
AND JULY 2006
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

